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fore, that the weights of the brain of negroes given by Dr. Tiedemann and Dr. Broca were not much to be depended on.

Mr. CARTER BLAKE stated that Dr. Broca had been engaged for a long time in making investigations on the subject of the brain in negroes, though no result had yet been made public. The observations of Dr. Peacock were grounded on a greater number of experiments than had been previously made, and were consequently of due value.

Dr. PEACOCK remarked on the difficulty of making such observations, as pure negroes seldom die in an English hospital. The observations in his paper had been accumulating for eighteen years.

Mr. CARTER BLAKE added that observations on the brain of the mulatto, of the most valuable character, had recently been made by Mr. Travers, the surgeon of the Charing-cross Hospital.

Mr. CARTER BLAKE then made a communication "on the Neanderthal Skull," a cast of which was placed on the table for examination, and a cast of the skull of a gorilla, as well as two negro skulls, was also placed by its side. Mr. Blake said:—

On the alleged Peculiar Characters, and Assumed Antiquity of the Human Cranium from the Neanderthal. By C. CARTER BLAKE, Esq., F.G.S., Hon. Sec. A.S.L., Foreign Associate of the Anthropological Society of Paris, etc.

I have now the honour to lay before the Society a cast of the "Neanderthal Skull," exhibited by Mr. J. R. Gregory (25, Golden Square, W.), and to call your attention to the descriptions of this skull which have appeared in the works of Fuhlrott, Schaffhausen, Busk, Huxley, Professor William King (of Galway), and myself,* copies of all which I place on the table, in order that members may have the opportunity of comparing the various discrepant opinions to which the discovery of this skull has given rise. The author of a paper has, I submit, a perfect and inalienable right to quote from his own writings; and as I have twice already told the tale of the Neanderthal skull, even in the pre-Lyellian age of the controversy, I shall make no excuse for making such copious extracts from my own previously published opinions, as may, according to my judgment, render the whole subject, alluded to in this avowed compilation, easier of solution. I shall afterwards read extracts from the writings of other palæontologists; I shall append a translation of the valuable *Memoirs*

* Fuhlrott. *Menschenliche ueberreste aus einer Düsselthals*. Bonn: 1859. Schaffhausen. *Natural History Review*, 1861, p. 160.

Busk. *Natural History Review*, 1861, p. 160.

Huxley (in *Lyell's Antiquity of Man*), 1st Edition, p. 80. (*Man's Place in Nature*, 8vo., London, 1863.)

Medical Times and Gazette, June 28, 1863.

Professor W. King. *On the Reputed Fossil Man from the Neanderthal*. (*Quarterly Journal of Science*, Jan. 1864.)

C. Carter Blake. *On the Occurrence of Human Remains Contemporaneous with those of Extinct Animals*. (*Geologist*, Sept. 1861, p. 395.)

C. Carter Blake. *On the Cranium of the Most Ancient Races of Men*. (*Geologist*, June 1862, p. 206.)

of Dr. Schauffhausen and M. Pruner Bey, and I shall conclude by a few remarks on the paper which Prof. King (of Galway) has recently published on this subject.

In September 1861, subsequent to the publication of Schauffhausen's and Busk's papers in the *Natural History Review*, I communicated a short note to the *Geologist*, in which I alluded to the following facts: "The most important, because the most recent, and the most generally canvassed human relic is that which Dr. Schauffhausen, of Bonn, has recently published, with remarks by Mr. George Busk, F.R.S., in the *Natural History Review* for April 1861. According to this statement 'in the early part of 1857, a human skeleton was discovered in a limestone cave in the Neanderthal, near Hochdal, between Düsseldorf and Elberfeld'. The opinions of geologists in Germany seem united to corroborate Mr. Busk's conclusion, that there can be no doubt of the enormous antiquity of this skeleton (found under a deposit of four or five feet of mud on the floor of the cave), and of the probability of its having belonged to what is termed the quaternary period. As, however, I know of no English geologist who has stepped forward to corroborate this theory, I hope that some of the many and intelligent readers of the *Geologist* may be led to consider the question.

"To the palæontologist this skull offers a source of interest, inasmuch as it exhibits a singular character, hitherto supposed to have been peculiar to the highest apes. All those persons who have seen the gorilla in the British Museum, or who have read M. du Chaillu's descriptions of its habits, must have been struck with the large and prominent supraciliary ridge which makes a development from the frontal bone, which gives to the animal that penthouse-like scowl over its eyes, and in which a crest of black prominent hairs is inserted, which greatly contributes to enhance the terrific appearance of the old male gorilla. This supraciliary ridge is characteristic of the genus *Troglodytes*; and in the chimpanzee it is also present, but to a less extent than in the gorilla. In this latter species a large amount of this elevation is due to the development of the space called by anatomists *frontal sinus*, which is a large cavity, divided into two portions by a perpendicular osseous partition, and lined with a continuation of the pituitary membrane, secreting the lubricating mucus discharged into the nose. This frontal sinus, Prof. Schauffhausen thinks, is the main cause of the production of the enormous supraciliary ridge in the Neanderthal cranium, as it is in the gorilla. Mr. George Busk dissents from this theory, and points out that in many recent crania of savage and barbarous men a considerable frontal elevation exists, in which no extraordinary expansion of the sinuses occurs; and Sir William Hamilton (*Metaphysics*, ii, p. 425) asserts, 'it is an error of the grossest, that the extent of the sinus is indicated by a ridge or crest, or blister in the external bony plate. Such a protuberance has no certain, or even probable, relation to the extent, depth, or even existence of any vacuity beneath.' In the Papuan and Australian races of men, which approach nearest to the ape in their cranial conformation, no frontal sinus whatever exists,

whilst a rather considerable frontal elevation is exhibited; whilst in the chimpanzee in which a remarkable supraorbital development exists, no frontal sinuses have been discovered.

"Professor Schauffhausen gives the measurement of a humerus, and radius, with two femora, in a perfect condition, and of part of ulna, humerus, ilium, scapula, and ribs; and it appears from his statements, that they exhibit characters of a human race, far transcending the present as regards power of muscle, as indicated by the thickness and rugosity of the bones.

"The presence and degree of development of the frontal sinus in the human and simian forms, are as follows:—

		Superciliary Arch.	Frontal Sinus.
1	..... European.....	Small	Large
2	..... Papuan.....	Rather large	None
3	..... Neanderthal skull	Large	?
4	..... Gorilla	Very large	Large
5	..... Chimpanzee.....	Large	None

"The above shows the difficulty of predicating the amount of the frontal sinus by the development of the supraciliary arch." And I then proceeded to state that "We find in the Neanderthal cranium a very fair development of brain, and in the general shape of the skull (the supraciliary ridge apart), we find nothing which approaches to the gorilla. No interparietal crest, obliterating the sagittal suture, extends along the head; and although the hinder part of the skull is broken away, we cannot infer anything which approaches to an occipital or lambdoid crest. None of the other characters which so prominently differentiate the human from the simian sub-kingdoms are to be found in this ancient skull. It is not cerebrally inferior to the Papuan or Negro races.

"Was this man from the Neanderthal of the same species as that which now dominates over the animal creation? Dr. Latham, in his *Ethnological Aphorisms*, says, "that all existing varieties of man may be referable to a single species, but there may be certain species which have ceased to exist." Should this Neanderthal man have proved an intermediate species between the Papuan and the gorilla, a great point of controversy would be gained by the transmutationists; but the failure of the proof which Dr. Schauffhausen has brought forward, leaves the human species as far from the apes as it was when the author, who founded the genus *Homo*, placed it apart from the other Primates." And concluding a short paper, in which other evidences of ancient human remains had been discussed, I said,—

"It seems, therefore, irrefragably proved that the human species existed in Europe in the post-pliocene age, in, as well as we can judge from the 'celts' of Abbeville, a state of semibarbarism. However sparse the population, he still found some enemy to contest with him the products of the forest, and the spoils of the chase. His vast solitude, compared with the present activity and teeming millions of modern Europe, reminds the contemplative observer of the beautiful exclamation of the patriotic Espronceda,

"Cuan solitaria la nacion que un dia
Poblara inmensa gente!"

"We have thus evidence of the existence of man-Man, the highest brained (archencephalate, Owen) individual of the highest sub-division of known *Mammalia*, in whose image the most specialised adaptation of structure to fixed purpose is superadded to the original type of created animal life, which great Archetype was conceived by a Divine Mind, millions of years prior to the advent of the human race." I certainly did not consider the Neanderthal skull as affording such peculiarities as would enable us to consider it as a distinct species of man.

In a subsequent paper, inserted in the *Geologist* for June 1862, "On the Crania of the most Ancient Races of Men," I further expressed my opinions regarding this skull at greater length. While this paper was going through the press, Professor Huxley, F.R.S., kindly permitted me to inspect the cast of the Neanderthal skull in his possession. It is my duty to acknowledge the great courtesy on his part by which these and other facilities, relating to cognate subjects, were given to me by that distinguished palæontologist. After due and diligent examination, however, I saw no reason to infer that it represented a distinct species or race to that which inhabits modern Europe. The following conclusions were then promulgated by me:—

"The apparent ape-like, but really maldeveloped idiotic character of its conformation is so hideous, and its alleged proximity to the anthropoid *Simiæ* of such importance, that every effort should be made to determine its probable date in time. That such efforts have not been made, and that the evidence at present in possession of English palæontologists is wholly inadequate to enable us draw any conclusion as to its being the representative of any given type of mankind, living or extinct, is the object of the following observations:

"The fact has not yet been conclusively demonstrated to the satisfaction of English geologists that the Neanderthal skull is of high antiquity. The time required for the deposition of the four or five feet of mud in the cave might have been accomplished in a comparatively short space of time. It is not stated at what height in the deposit the bones were found.

"Dr. Schauffhausen's statement, 'that the bones adhere strongly to the tongue, although, as proved by the use of hydrochloric acid, the greater part of the cartilage is still retained in them, which appears, however, to have undergone that transformation into gelatine which has been observed by Von Bibra in fossil bones,' is hardly precise enough to convince practical geologists of the antiquity of the skull. But of the Engis cranium no such evidence is afforded us. It is hardly necessary to repeat the arguments made use of by Buckland against Schmerling at the meeting of German naturalists at Bonn, which proved the less degree of gelatine in the fossil hyæna bones than in the human remains from the Belgian cave deposits. The condition of the Vale of the Trent skull, which has been apparently immersed in glue or some analogous liquid since its disinterment, has deprived us of the only chemical evidence which could have decided the question of its antiquity. Professor Huxley admitted to his audience at the Royal Institution (Feb. 7, 1862) that,

with respect to the Neanderthal cranium, 'its great antiquity was not directly proved, although its date was undoubtedly very early.* Professor Huxley went to say, that in the Museum of the College of Surgeons there are Australian skulls which closely correspond in configuration and development with those of the caverns of Engis and the Neanderthal, the differences between which latter were 'hardly greater than occurred between individuals of that race, while in form the ancient and Australian skulls presented many analogies.'

"There are several suspicious circumstances connected with the Neanderthal cranium, *e. g.* the pathological enlargement of the coronoid process of the left *ulna*, apparently from an injury during life; the peculiar rounded shape and abrupt curvature of the ribs, analogous in their appearance to those of a carnivorous animal; Professor Schauffhausen supposes this malformation to arise from an unusually powerful development of the thoracic muscles. All these characters are compatible with the Neanderthal skeleton having belonged to some poor idiot or hermit, who died in the cave where his remains have been found. They are incompatible with the evidences which might be left in a Westphalian bone-cave of the remains of a normal healthy uninjured human being of the *Homo sapiens* of Linnæus."

With respect to the prominent supraorbitals in the Neanderthal skull, I thus expressed myself:—

"The broad ground may be admitted, that the earliest Briton skulls generally exhibit a supraorbital projection, which attains in its development, however, nothing like the size of the ridge of the Neanderthal cranium. The majority of the British, Hibernian, and Caledonian skulls figured by Messrs. Davis and Thurnam† exhibit a large supraorbital ridge. This character is also present in a few of the Saxon skulls.

"The supraorbital development of the Briton skull from Ballidon Moor‡ is fully equal to that of the Engis cranium. The Neanderthal skull, however, admittedly stands *sui generis*.

"The Museum of Natural History at Copenhagen contains skulls of the 'Stone Period' in Denmark with an excessive supraorbital projection.

"Aboriginal American races of high antiquity often exhibit a large supraorbital development. This may be seen on examining Morton's§ plates of the Peruvian from Pachacamac ('Temple of the Sun'), plate 11A, and the skulls of mound-builders from the Upper Mississippi (plate 52), Tennessee (plate 55), and Steutenville, in Ohio (plate 68).

"The frontal development of the Australian race, accompanied by an absence of the frontal sinus, has been frequently noticed, and several Australian skulls have the supraorbital ridge overhanging the origin of the nasals to the degree shown in the skulls from Engis and the valley of the Trent.

* Medical Times, February 15, 1862.

† Crania Britannica. 4to and folio. London: 1856.

‡ Loc. cit.

§ Crania Americana. Philadelphia: 1839. In a Pachacamac skull before me there is a very slight supraorbital development.

"Supraorbital development in the Negro is far from being a constant character. It is undoubtedly present in many of the lower Negroes, but I have now before me a skull from Ashantee which exhibits less supraorbital development than many of the skulls from the 'Stone Period' in Denmark.

"In India, the range of variation offered by the hill-tribes of Nepal exhibits the supraorbital ridge under a variety of aspects. The low-caste individuals, perhaps of all nations, have a greater tendency to repeat this character than the more elevated types. In Europeans, however, of high intellect, this conformation may frequently be remarked; and I have observed it in more than one person with whom it was correlated with a high degree of mental ability."

For various reasons, the opinions which I then put forth were opposed to the popular belief with regard to the Neanderthal skull. Some writers authoritatively declared that we had at last discovered the "missing link" which binds together man and the apes. These opinions were, however, opposed, and I extract the following passage from a criticism on my last quoted paper in the "Medical Times and Gazette," of June 28, 1862:—

"The Neanderthal cranium has been already described in this journal. It is only necessary to remind the reader that its characteristics are the extraordinary size of the supra orbital ridges, which are continuous over the root of the nose, and a remarkably low retreating frontal development, which together give to the skull a markedly simian look. We strongly suspect that Mr. Blake is right in the conjecture he throws out, that this skull belonged to some poor idiotic hermit whose remains were found in the cave where he died. Professor Schaufhausen tells us that the other portions of the skeleton presented deviations from the normal human form. The ribs exhibited a peculiarly rounded shape and abrupt curvature, which he refers to an unusually powerful development of the thoracic muscles. The coronoid process of the left ulna was enlarged, apparently from injury during life. The description strongly reminds one of Sir Walter Scott's Black Dwarf. A theory of rickets and idiocy would, we suspect, go some way towards unravelling the mystery."

The publication of Sir Charles Lyell's and Professor Huxley's works naturally gave an increased stimulus to the consideration of this curious skull. As, I hope, these valuable works are within the reach of every anthropologist in England, I shall here be excused from quoting any more than the following passage from the former volume, containing some of the observations of Professor Huxley on the Neanderthal skull.

"The Neanderthal skull, with which also I am acquainted only by means of Professor Schaufhausen's drawings, of an excellent cast and of photographs, is so extremely different in appearance from the Engis cranium, that it might well be supposed to belong to a distinct race of mankind. It is 8 inches in extreme length and 5·75 inches in extreme breadth, but only measures 3·4 inches from the glabella-

occipital line to the vertex. The longitudinal arc, measured as above, is 12 inches; the transverse arc cannot be exactly ascertained, in consequence of the absence of the temporal bones, but was probably about the same, and certainly exceeded $10\frac{1}{4}$ inches. The horizontal circumference is 23 inches. This great circumference arises largely from the vast development of the superciliary ridges, which are occupied by great frontal sinuses whose inferior apertures are displayed exceedingly well in one of Dr. Fuhlrott's photographs, and form a continuous transverse prominence, somewhat excavated in the middle line, across the lower part of the brows. In consequence of this structure, the forehead appears still lower and more retreating than it really is.

"To an anatomical eye the posterior part of the skull is even more striking than the anterior. The occipital protuberance occupies the extreme posterior end of the skull when the glabello-occipital line is made horizontal, and so far from any part of the occipital region extending beyond it, this region of the skull slopes obliquely upward and forward, so that the lambdoidal suture is situated well upon the upper surface of the cranium. At the same time, notwithstanding the great length of the skull, the sagittal suture is remarkably short ($4\frac{1}{2}$ inches), and the squamosal suture is very straight.

"In human skulls, the superior curved ridge of the occipital bone and the occipital protuberance correspond, approximatively, with the level of the tentorium and with the lateral sinuses, and consequently with the inferior limit of the posterior lobes of the brain. At first, I found some difficulty in believing that a human brain could have its posterior lobes so flattened and diminished as must have been the case in the Neanderthal man, supposing the ordinary relation to obtain between the superior occipital ridges and the tentorium; but on my application, through Sir Charles Lyell, Dr. Fuhlrott, the possessor of the skull, was good enough not only to ascertain the existence of the lateral sinuses in their ordinary position, but to send convincing proofs of the fact, in excellent photographic views of the interior of the skull, exhibiting clear indications of these sinuses.

"There can be no doubt that, as Professor Schaaffhausen and Mr. Busk have stated, this skull is the most brutal of all known human skulls, resembling those of the apes not only in the prodigious development of the superciliary prominences and the forward extension of the orbits, but still more in the depressed form of the brain-case, in the straightness of the squamosal suture, and in the complete retreat of the occiput forward and upward, from the superior occipital ridges.

"But the cranium, in its present condition, is stated by Professor Schaaffhausen to contain 1033.24 cubic centimeters of water, or, in other words, about 63 English cubic inches. As the entire skull could hardly have held less than 12 cubic inches more, its minimum capacity may be estimated at 75 cubic inches. The most capacious healthy European skull yet measured had a capacity of 114 cubic inches, the smallest (as estimated by weight of brain) about 55

cubic inches, while, according to Professor Schaaffhausen, some Hindoo skulls have as small a capacity as about 46 cubic inches (27 oz. of water). The largest cranium of any gorilla yet measured contained 34·5 cubic inches. The Neanderthal cranium stands, therefore, in capacity, very nearly on a level with the mean of the two human extremes, and very far above the pithecoïd maximum.

"The Neanderthal cranium has certainly not undergone compression, and, in reply to the suggestion that the skull is that of an idiot, it may be urged that the *onus probandi* lies with those who adopt the hypothesis. Idiocy is compatible with very various forms and capacities of the cranium, but I know of none which present the least resemblance to the Neanderthal skull; and, furthermore, I shall proceed to show that the latter manifests but an extreme degree of a stage of degradation exhibited as a natural condition, by the crania of certain races of mankind."

The remarks by Professor Huxley on the same subject in his *Man's Place in Nature* are chiefly an expansion of the observations by the same author in Lyell's work. They, however, contain a most interesting drawing of the lateral sinuses, to which Dr. Schaaffhausen, as will be seen in the sequel, draws special attention. On the conclusions or arguments which Sir Charles Lyell and Professor Huxley have based on the above cited facts, I shall not comment.

In the order of publication the next memoir which we have to consider is that which Dr. Schaaffhausen contributed to the Paris *Société d'Anthropologie* on the 13th of March last; I shall give the Society a verbatim translation of this important memoir, the contents of which have, to my knowledge, not previously been laid before an English scientific public.

A very able and elaborate paper appears in a new periodical, the *Quarterly Journal of Science*; Professor W. King, of Galway, contributes a paper to this periodical, which is undoubtedly of the highest scientific value in the controversy. The following new and important facts are pointed to by Professor King, in addition to those which he has derived from other observers:—

"Another differential feature characterises the fossil in question. In human skulls, even those belonging to the most degraded races, if the forehead be intersected at right angles to the glabello-occipital plane, on a line connecting the two outer orbital processes at their infero-anterior point, the intersection will cut off the frontal bone in its entire width, and to a considerable extent rising towards the coronal suture; whereas in the Neanderthal skull, the same intersection will cut off only the inferior and little more than the median portion of the frontal. This is quite a simial characteristic, and rarely, if ever, occurs in man.*

* "I have examined and made myself acquainted with skulls belonging to the principal races or varieties of man, in all of which the forward position of the forehead, relatively to the outer orbital processes, is the general rule. The Engis skull exhibits it, and the same appears to be the case with the Borreby one, judging from the figure in Lyell's *Geological Antiquity of Man*, p. 86. It

"The last peculiarity is concomitant with another equally striking. Viewing the Neanderthal forehead with reference to the situation of that portion of the brain which it enclosed, we may plainly perceive that the frontal lobes of the cerebrum have been situated *behind* the outer orbital processes. As far as I have ascertained, we cannot say this of man; for, apparently, in all existing races, whose skull has not been modified by artificial pressure, the corresponding parts of the brain actually extend in *front* of the orbital processes.*

He further applies a method of analysis, which, according to my interpretation, is novel to this investigation, and states:—

"*Occipital*.—The upper portion of this bone is quite semicircular in outline, its sutural (lambdoidal) border running with an even crescentic curve from one transverse ridge to the other: generally in human skulls, including the Engis one, the outline approaches more or less to an isosceles triangle. The width of the occipital at the transverse ridges is much less than is common to man; and the disparity is the more striking in consequence of the widest portion of the fossil occupying an unusually backward position.

"Taking into consideration the forward and upward curving of the upper portion of the occipital bone as previously noticed, its semicircular outline, and smallness of width, we have in these characters, taken together, a totality as yet unobserved in any human skull belonging to either extinct, or existing races; while it exists as a conspicuous feature in the skull of the Chimpanzee.

"*Parietals*.—In man the upper border of these bones is longer than the inferior one; but it is quite the reverse in the Neanderthal skull. The difference, amounting to nearly an inch, will be readily seen by referring to figures 1 and 2, in plate 11.; the former representing the right parietal of a British human skull, and the latter the corresponding bone of the fossil. These figures also show that the Neanderthal parietals are strongly distinguished by their shape, and the form of their margins: in shape they are five-sided, and not subquadrate, like those of the British skull;† while their anterior and

may be doubted that the Plymouth skull, represented by Busk (*Natural History Review*, 1861, Pl. V, fig. 6), is an exception. I possess a very remarkable skull, probably about 500 years or more old, taken last summer out of the beautiful ruins of Corcomroo Abbey, situated among the Burren mountains, in county Clare, which offers a close approximation to the fossil in the depressed form of the forehead: indeed, although not altogether so abnormal in this respect as the Neanderthal skull, it has in appearance a better development, in consequence of the median part of its frontal being a little more rounded. There is no reason to believe that it belonged to an idiot, as it happens that most of the skulls lying about the ruins have a low frontal region. It is singular that the inhabitants of Burren a few hundred years ago should have been characterised by a remarkably depressed forehead, while those now living have a well-developed cranial physiognomy." (Prof. King.)

* "The Corcomroo skull, noticed in the previous footnote, although closely approximated to the Neanderthal one in its low forehead, and this alone, is strictly human in the forward extension of the frontal lobes of the brain relatively to the outer orbital processes." (Prof. King.)

† The outlines were taken by pressing a sheet of paper on the parietals; and, when in this position, marking their margins by following the bounding

posterior margins have each exactly the reverse of the form characteristic of man.

"The *additamentum*, which undoubtedly gives the parietals their five-sided shape, is on a level with the superior transverse ridge, and much longer than usual. This peculiarity is common to the human fœtus: I have, likewise, observed an approach to it in a 'Caffre' skull belonging to the Dublin University Museum, in which, also, the upper and lower borders of the parietals are about equal in length. But still the abnormality of the latter case is not at all so extreme as the condition observed in the fossil. These particular features also are characteristically simial; for in extending our survey to the Chimpanzee, and some other so-called Quadrumanes, their parietals are seen to present a great similarity to those of the Neanderthal skull.*

The following are Professor King's conclusions:—

"Besides, so closely does the fossil cranium resemble that of the Chimpanzee, as to lead one to doubt the propriety of *generically* placing it with man. To advocate this view, however, in the absence of the facial and basal bones, would be clearly overstepping the limits of inductive reasoning.

"Moreover, there are considerations of another kind which powerfully tend to induce the belief that a wider gap than a mere generic one separates the human species from the Neanderthal fossil.

"The distinctive faculties of man are visibly expressed in his elevated cranial dome—a feature which, though much debased in certain savage races, essentially characterises the human species. But, considering that the Neanderthal skull is eminently simial, both in its general and particular characters, I feel myself constrained to believe that the thoughts and desires which once dwelt within it never soared beyond those of the brute. The Andamaner, it is indisputable, possesses but the dimmest conceptions of the existence of the Creator of the Universe: his ideas on this subject, and on his own moral obligations, place him very little above animals of marked sagacity;† nevertheless, viewed in connection with the strictly human conformation of his cranium, they are such as to specifically identify him with *homo sapiens*. Psychical endowments of a lower grade

sutures; next, by cutting the paper according to the lines given by the sutures, and allowing it to retain its acquired convexity: the outlines were then marked off on another sheet of paper. Possibly the antero-inferior angle of the Neanderthal parietal, as given in the figure, is not strictly correct, owing to the coronal suture being obliterated in that part, but I venture to state that it is approximately true." (Prof. King.)

* "On the cast, an incised line runs from the lambdoidal suture (where the *additamentum* joins it) towards the posterior tubercle. Is this the suture which occurs near and parallel to the transverse ridges in fetal skulls, and occasionally in that of adults? In the skull of the "Caffre," noticed in the text, this suture, which is only seen on the right side, is situated above the ridge; but in the fossil it is below this part." (Prof. King.)

† "It has often been stated that neither the Andamaners, nor the Australians, have any idea of the existence of God: there are circumstances, however, recorded of these races which prevent my accepting the statement as an absolute truth." (Prof. King.)

than those characterising the Andamaner cannot be conceived to exist: they stand next to brute benightedness.

"Applying the above argument to the Neanderthal skull, and considering that it presents only an approximate resemblance to the cranium of man, that it more closely conforms to the brain-case of the Chimpanzee, and moreover, assuming, as we must, that the simial faculties are unimprovable—incapable of moral and theositic conceptions—there seems no reason to believe otherwise than that similar darkness characterised the being to which the fossil belonged."*

Dr. Schaaffhausen, of Berne, had sent to Dr. Pruner Bey the cast of the celebrated Neanderthal skull, which is in his possession, and added to it the summary of a work which he recently read on this subject to the Natural History Society of the Rhine and Westphalia. A translation of the memoir is appended.

"The opinion which I expressed in 1858, in *Müller's Archiv*, and which, since that time I have reproduced at various periods, on the coexistence of man and extinct mammalia, is found to be confirmed by the last work of Sir C. Lyell on the *Antiquity of Man*. In 1861, Mr. Busk published, in the *Natural History Review*, a translation of my above cited memoir, adding to it certain commentaries. Since then, Professor Huxley has made on the Neanderthal skull detailed researches, which have been inserted in the work of Lyell, and which he has recently reproduced in his work entitled *Evidence as to Man's Place in Nature*. I shall oppose the following observations to the opinions put forth by these scientific men.

"Mr. Busk erroneously doubts that the enormous supraciliary elevations on the Neanderthal skull are the result of large frontal sinuses. Professor Huxley agrees with me, that the peculiar conformation of this skull cannot be considered either as pathological or as artificial; but that, on the contrary, it presents the type of an ancient race; and he adds that this skull resembles those of the apes more nearly than any one yet known. On the other hand, the large cranial capacity which appears from my measurements, and the condition of the other bones of the same skeleton, are the solitary circumstances which prevent Sir C. Lyell from considering these bones as a proof of progressive development, and the consequent derivation of man from the ape. To obviate such an interpretation, I had expressly said in my first work, "It would not be permissible to recognise in such a conformation of the skull the most rude primitive type of man; as these exist amongst existing savages, which, without recalling the features of the great apes by so singular a frontal conformation, are, nevertheless, to be found, in other respects, in an equal degree of arrested development." The assertion of Professor Huxley, that the posterior part of the skull is even more striking than the anterior, is without foundation. According to this author, the upward and forward direction of

* "A paper advocating the views contained in this article was read at the last meeting of the British Association, held in Newcastle-on-Tyne. In that paper I called the fossil by the name of *Homo Neanderthalensis*; but I now feel strongly inclined to believe that it is not only specifically but generically distinct from Man." (Prof. King.)

the squama occipitis, the shortening of the sagittal suture, the entirely straight edge of the temporo-parietal suture, and, in general, the flattened form of the skull, which scarcely admits the possibility of lodging in it the posterior lobes of a human brain, approaches the skull to that of an ape more than does the conformation of the lower frontal region. But Professor Huxley has forgotten that all these peculiarities are equally encountered on the skulls of other inferior races; the only character which exclusively belongs to the Neanderthal skull is the entirely animal ridge which bounds upwardly the orbital cavities. Finally, the remark of Professor Huxley, that the two lateral sinuses, *i.e.*, the lower limits of the posterior cerebral lobes, are perfectly visible, is also entirely erroneous: this remark was made in accordance with photographs; but on the specimen there only exists the commencement of the right sinus, where it takes its origin from the superior longitudinal sinus. If, when finally Professor Huxley superposes the cranial contours of the Neanderthal savage, the Australian, and the European, such process only gives a very imperfect idea of the various degrees of their development, because no account is therein taken of the breadth of the skull, which every craniologist recognises as of importance in the calculation of cranial forms. It is not less remarkable that Professor Huxley should have found an Australian skull comparable to that of the Neanderthal. But, according to the opinion of all naturalists (Becker, Martin, Lucae, Ecker), the Australian skull is narrow, elevated, and sloping down like rafters rapidly from the vertex towards the temples, whilst that of the Neanderthal is very depressed, posteriorly enlarged, and without any trace of the indicated conformation.

"To acquire a distinct idea of the cerebral development of the Neanderthal skull, I obtained from Dr. Fuhlrott permission to take a cast of the cavity. This specimen entirely confirms the conclusions which I had drawn from the form and the extent of the cranial cavity compared with that of the inferior races. The cast of the brain shows a great resemblance with that of an Australian presented at the same time to the Society, so far as regards the small cerebral development. The last cast even offers dimensions slightly more favourable. The difference between the two cranial forms is also equally distinct in the brain. The following is the result of the comparative measurement of the casts.

	Length of the hemispheres.		Width of the anterior lobes.		The greatest width.		Greatest height.*
Neanderthal	173 mm	...	112 mm	...	136 mm	...	66 mm
Australian	164 "	...	100 "	...	125 "	...	77 "

"Dr. Lucae has demonstrated that the weight of the brain of the European surpasses, on an average, by 300 grammes, that of the Australian. So far as regards dimensions, it is neither in length nor in height that the first considerably exceeds the second, but greatly in width. This race difference was already manifested in the most remote antiquity when our countries were inhabited by men who, as

* Taken at the line which joins the anterior to the posterior lobes.

regards intelligence, were on a level with the existing savages of Australia. Finally, with respect to the age of the human bones of the Neanderthal cave, I think that the presence of the tooth of a bear which was found in the same bed, and which externally so much resembles fossil teeth, would render such antiquity probable for the skull, without, however, demonstrably proving it. I shall further remark, that No. lxiii. of the *Decades Craniorum* of Blumenbach, which represents a Dutch skull from the Isle of Marken (*Batavus Genuinus*), offers a great resemblance with that of the Neanderthal. To conclude, I consider that the remains are probably the most ancient vestige of the inhabitants of Europe."

"*Observations on the Neanderthal Skull by M. Pruner-Bey.*—In reporting on the judicious observations of Dr. Schaaffhausen, which you have just heard read, I shall, in the first place, inquire in what this skull can be found to resemble those of the apes. It is the frontal region which has given it this definition; I place before you the skull of a young chimpanzee, the ape whose skull most resembles that of man, and also the skull of an adult gorilla. The human skull exhibits a strange development of the supraciliary arches, and above them a singular low and receding forehead; at the first glance an observer might entertain the indicated opinion for a moment. I shall proceed to examine the details.

"In the man, the supraciliary eminences are distinctly separated from the glabella; their base, attached to the frontal, is very large, with narrow edges and a hollow interior. In the two apes these relations are found in an inverse degree; the forehead is bounded by a continuous crest, slender at its base, enlarged at its edges, and its interior is filled with diploë. Excluding all that relates to the exaggerated prominence of the crest in the ape, I shall ask whether it is resemblance or dissimilarity which is exhibited in the specimen before us. For my part, I consider that it is the latter. Before proceeding to the classification of the Neanderthal skull, let us remember that the supraciliary arches exhibit a large development in savage races, as for example in the New Caledonians and Australians; in the last, as well as the Tasmanians, the frontal sinus is frequently absent. Let us further notice, that the greatest part of the ancient skulls found in Europe also show an exaggerated development of the supraciliary arches, which, nevertheless, does attain that of the skull before us. Nevertheless, we already know two cases, where ancient brachycephalic skulls, by the same peculiarity, have produced on observers the same impression. One of these skulls is that of which I have just shown you the lower jaw, and which was derived from a Swiss brachycephale. The other is that of Borreby, in Denmark, figured in the last work of Sir C. Lyell. There are, then, in different races, individual cases exhibiting the same peculiarity. Let us now try if it is possible to classify the Neanderthal skull. Is it the representative of a lost race, or can it be identified with any of the stocks which are known to us? In my opinion, it is undoubtedly the skull of a Celt; it belonged to a large individual; it is capacious and dolichocephalic; it presents the depression on the posterior third

of the sagittal suture, common to the Celts and Scandinavians; and finally, its occipital projection is equally characteristic of these two races. To give greater weight to my assertion, I shall place before you three ancient skulls, of which one is that of an Allobroge or Helvetian, of Switzerland. The two others were derived from Ireland. Whilst they all present the same general type, these three skulls exhibit slight differences. There even exists a fourth variety, represented in the collection of Retzius by an ancient Belgian, whose skull is more compressed laterally than that of the first Irishman, which is almost cylindric. Let us remark that in the gallery of the Museum there is a sufficiently numerous series of ancient French skulls of the same type in every respect as those which we have before us. Further, in comparing the drawings which we have of ancient dolichocephali, discovered at Engis by M. Schmerling, and at Meilen, in the Lake of Zürich, we ascertain that the first corresponds to the second Irish skull, and the second to the Swiss skull. We may also remember that Mr. Schaaffhausen has already remarked the resemblance between the Neanderthal skull and the Belgian, figured by Blumenbuch.

"Without at this time entering into descriptive details respecting the ancient Celtic skull, you will recognise with me that all the ancient skulls before us present a very depressed forehead, compared with the enormous facial development. Do not let us forget at this time the law of compensation, for that which the forehead of the ancient Celt loses in height, it gains in length. It is also very remarkable that the ancient skull of the female Celt presents, contrariwise to that of her husband, a finely elevated forehead, and something very charming in the face. The female skull I present to you is a contemporary of the Allobroge or Helvetian. It equals in thickness that of the Australian.

"You will see by the annexed note that the Neanderthal skull does not essentially diverge from its *frères d'origine*, the three Celts whose skulls are before us; taking the three measurements possible on the calvarium.

MEASURES TAKEN ON THE FOUR SKULLS (IN CENTIMETRES).

	Length.	Breadth.	Circumference at the level of the supraciliary ridges.	Circumference above the supraciliary ridges.
Neanderthal	20.5	15.0	59	56
Helvetian	19.5	14.5	57	55
Irish (No. 1)	20.0	15.0	58	57
Irish (No. 2)	20.5	14.3	57	56

"But are these skulls really Celtic? What proof have we of this allegation? 1st. The locality whence they were derived belongs, unquestionably, to the ancient Celtic area. 2nd. Comparison by the retrogressive or progressive method with skulls of Bretons, French, and modern Irishmen, in which the mass are undoubtedly Celtic,

confirms our opinion. Although the Celtic skull has undergone some secondary modifications, its type is at the present day the same as in the most remote ages. I refer to the beautiful series of modern skulls in the Museum, derived from Brittany, and to my own collection of modern Irish skulls.

"Another question may be demanded regarding the osseous relic from the Neanderthal. Was it the skull of an idiot? If an idiot is necessarily, absolutely, and always a microcephale, our Celt, who possessed so large a cranial capacity, could not have been included in this category. Nevertheless, if the deep depressions which the cerebral convolutions have left in the cranial cavity, as well as the prominence of the supraciliary ridges, should, according to MM. Gratiolet and Broca, bear witness in favour of this opinion, I would incline to accept this hypothesis. The condition of idiocy has its degrees like every other affection of the kind; and it is possible that we may have before us the skull of an individual in whom the intelligence was developed. As nevertheless, I stand here before a whole pleiades of scientific brethren, who have pursued these investigations far more than myself, I must leave the decision of this question to judges in every subject more competent than myself.

"To sum up shortly the results of our study.

"1. Although we have already descended to the level of the drift, we do not yet see, at least in this part of Europe, anything which denotes the horizon which indicates the filiation of man with the ape.

"2. Until we have further information, there is nothing known respecting the resemblance of the pretended primitive man of Europe with the Australians, Caribs, negroes, etc.

"3. On the other hand, we find ourselves in the most remote antiquity in the presence of two distinct races, of which the descendants survive to the present day."

When this paper by M. Pruner Bey was read before the Paris Society, M. Broca made the following highly valuable and important observations thereon. He said:—"The whole of M. Pruner Bey's arguments repose on one basis, the knowledge whether the peculiar form of the Neanderthal skull is pathological. As we have never seen such a skull, and do not wish to admit that it belonged to a race of which no other vestige remains to us, we are forced to seek a morbid origin for the peculiarities which it presents. But I believe myself able to demonstrate that this skull could not be derived from an idiot; what is indicated by the fact, in both the idiot and the gorilla, of the prominence of the supraciliary arches and the retrocession of the forehead? It is indicated that the cerebral mass is not greatly voluminous, and that the anterior and posterior lobes converge towards the ideal centre of the head. No such condition is produced in any other form excepting than that which is concomitant with microcephaly. But the Neanderthal skull is not that of a microcephale.

"Two years ago I saw at Bicêtre, an idiot who had an enormous head, and of whom the appearance appeared to contradict the opinion of those who attribute importance to the volume of the brain in intel-

lectual manifestations. But at the autopsy we found the cranial integuments with their osseous case irregularly thick. The brain was, in reality, very small; it weighed less than 1,100 grammes, but its size precluded its arrangement amongst microcephali. To find a skull comparable to that of the Neanderthal, we must have recourse to the microcephalic idiot. As for the large impressions, indications of convolutions few in number, this character actually exists in idiots, but it also exists in all men with large convolutions, and in the individuals of inferior races. So that the brain of the Neanderthal man may merely be that of an individual of inferior race. To sum up my objection in a few words; idiocy, capable of producing such a skull is necessarily microcephalic; but this skull is not that of a microcephale; therefore it is not that of an idiot."

In the above remarks I have endeavoured to give a fair epitome of the state of the controversy respecting the skeleton from the Neanderthal, so far as it has been recently carried on in France and Germany. I have abstained from offering any opinion of my own on this topic, and from attempting to collate the testimony of so many discrepant observers. When photographs are given by one writer,* which purport to exhibit structures which the possessor of the original specimen declares to be absent, it would be futile for any person who has not the specimen before him to attempt to offer an opinion which could be capable of reconciling such conflicting statements. Doubtless, future speculators will have some more tangible ground whereon to found their theories than the description of structures whose existence is as yet unproven. But I must reply to those who say that the *onus probandi* lies upon those zoologists who may assert that the Neanderthal skull once belonged to an idiot. As a question of logical truth, there is no *onus* in the case; no need why any hypothesis should be propounded into which the known facts of the case should be compressed as best they may, and the future facts which may be discovered ignored, in order that a convenient theory may be at once generally accepted. Taking the several hypotheses; that the skull in question is that of a low "pithecoïd" race of man, with many affinities to the Australian, or other dark races; that it is a distinct species, or even distinct genus of *Anthropini*; that it was the skull of a powerfully organised Celt of low mental organisation, but in race identical with the historical Celt; or that it was the skull of an individual in whom rachitis or some congenital defect or even accident, may have combined to produce the pathological condition of the *ulna*, the abnormal form of the ribs, the peculiar frontal conformation which is associated with several of the forms of the macrocephalic idiot, and the hypertrophied condition of the cranial walls; it is our duty to test these hypotheses severally, and give due allowance for the small proportion of truth there may be in each of them. Forensic skill may advocate any one of these hypotheses; it may select the favoured theory, whilst suppressing, ignoring, or distorting the opinions and facts of other observers; it may place the diverging arguments in

* See Huxley. Evidence as to Man's Place in Nature, p. 141, fig. 26. 8vo. Lond. 1863.

such a form as to shift the *onus* on the opponent, instead of adopting the more difficult, although more conclusive procedure, of proving one's own case; and the recital of one or two of the above arguments may be promulgated as "evidence" as to the place in nature of an enigmatical or singular form. But such methods of reasoning are not those of the inquirer, who, accepting the evidence of the possessor of the skull as to its physical conformation, declines to express an opinion as to its probable or hypothetical relationship with those of tribes at the antipodes; who admits that the state of our knowledge respecting the posterior portion of the skull is inadequate on which to found any generalisation; and who recognises in the great development of the supraorbital ridges nothing more than the mere exaggeration of a cranial type common in many of the lower Celtic and Teutonic forms. Such are the few ascertainable facts; the hypothesis of idiocy, although it may be rejected by those who have not enjoyed the pleasure of inspecting the skull any more than myself, has as great evidence on its side as any of the divergent and discrepant theories above cited. Its nature, however, essentially precludes its conclusive demonstration; and I hope that no one will misunderstand me so far as to consider that I am committed *simpliciter* to its avowal.

Whilst the question of the mental endowments of the Neanderthal man must remain for a long period unanswered, I am afraid that the speculations of Professor King as to the precise theological belief professed by the individual must remain in abeyance. Evidence has been, and will be, laid before anthropologists in Europe to prove that the belief in a God is not an inherent idea in the mind of all savages; but to enter into that question would take me far beyond the limits of this paper. As regards, however, the generic distinction of the Neanderthal man from the *homo sapiens* of our monogenistic ancestors, or the many unnamed species of man whose separate existence polygenists may affirm, I cannot see the grounds on which generic distinction can be affirmed. If, however, such there be, the rules of the binomial nomenclature suggest that a new generic and specific name should be given to the *Homo Neanderthalensis*. Although I will not undertake the task of describing the new genus of manlike beast which is indicated "*abest omnium proxime a simis*," until my friend Mr. Winwood Reade shall have brought us over a few cagefuls of Neanderthaloid apes from Equatorial Africa, I trust that the term *Nidum equinum* may complete all the necessary formalities in the identification of a genus the priority of description in which I leave to the first observer who may wish to develop the *canard*.

Mr. REDDIE hoped that when Mr. Blake's communication was printed, he would give the measurements he had quoted in English measures, so that like things might be compared with like. With respect to the skull that had been the subject of the communication, whatever difference of opinion might exist as to its intellectual developments, and however low the race of man it might indicate, it was, nevertheless, the skull of a man, and not of an ape. The dis-

inction between a man and the inferior animals in their intellectual capacities was so great that they could not be mistaken. The gorilla, for example, might have sufficient sense to warm itself at a fire made by negroes, but it had not common sense enough to put on more logs of wood to keep the fire burning.

Mr. ALFRED R. WALLACE said he had examined the extensive series of crania in the Museum at Oxford, where there are crania of New Zealanders, of Australians, the natives of New Guinea, and of other aboriginal tribes, for the purpose of observing if there were any corresponding peculiarities. He was enabled to discover that some of the Australian crania agreed with the Neanderthal skull, in general shape, in the slanting forehead, the orbital ridges, and in other particulars, and the impression on his mind was that they were exactly of the same type. But that was not, however, the usual form of Australian skulls, for there were others very different. The majority of them, indeed, were totally different, whilst there were others that had an intermediate form. The skulls of the Van Dieman's Land natives also approached in general form to the Neanderthal skull. In some burial grounds in this country there are occasionally to be found skulls which nearly approximate to those of Australians. These facts showed how difficult it is to draw general results from agreements in the forms of different crania. He felt satisfied that there was no reason to believe that the Neanderthal skull belonged to any other than a savage race of man in a low state of development, and that it was not the skull of an idiot, but of a common man of the same race.

Mr. BOUVIERIE PUSEY said the speech of Mr. Wallace suggested the question whether the Australian skulls he examined at Oxford belonged to natives of the same tribe, or whether they were the skulls of different tribes?

Mr. WALLACE said he was unable to answer the question.

Sir CHARLES NICHOLSON observed that his own experience and recollection confirmed Mr. Wallace's statement respecting the resemblance of the skull in question to those of some skulls of Australians. It reminded him strongly of skulls he had seen in Australia, though there were some peculiarities in it. There were to be found among the natives of Australia great varieties; for though there were some extremely low types among them, there were others, again, so different that it was difficult to distinguish their skulls from those of Europeans. An instance of this occurred at Sydney, in the Museum of which town there was a collection of the skulls of transported criminals, and of the aborigines; but the labels on them having been accidentally lost, many of them could not be distinguished, and to this day no one could tell which was which. It was a curious fact, he observed, that some of the lowest types of animal and vegetable life should be now found living in Australia which had long since been extinct in Europe. In Australia, where the aboriginal human races are fast dying out, there are still existing types of the flora and fauna of the earliest period in which they appeared on the earth in Europe. For example, the first fossil mammal that

occurred in the ascending series of strata was a marsupial animal, corresponding in general character with those now living in Australia, where there are several existing analogues of the fossil flora and fauna, extinct in this part of the world. Sir Charles Nicholson expressed the hope that new light would shortly be thrown on the relations of the lower types of animals with the higher by the investigations of Professor Owen, who is now in France, making observations *in situ* on the organic remains found in some ancient caverns.

Mr. CARTER BLAKE, in reply, alluded in the first place to the suggestion of Mr. Reddie that the measurements he had quoted should be given in English measures. He said he should certainly not undertake to change the French measures into English, but he should be glad, on the contrary, to see the reverse done, as the decimal measures were much more convenient, and more generally applicable for the use of scientific men. With respect to the varieties said to exist among the tribes of Australia, it was evident from what had been stated that manifestly distinct forms of skulls were to be found there, but it was a question whether there were wider differences among the natives of Australia than of any other country. Professor Huxley had called attention to a skull in the Museum of the College of Surgeons which resembled the Neanderthal skull. It seemed, indeed, useless to go so far as Australia to look for corresponding forms of skulls, while similar forms were to be found in Ireland, Scotland, and in many other places nearer home. He hoped that what he had said would not be taken as throwing any doubt on the transmutation theory, which he considered a very rational hypothesis. Though the assumed great antiquity of the Neanderthal skull might be proved to be an error, which had arisen from the misrepresentations of German describers of the circumstances in which it was found, he felt assured they had only to wait until some other discoveries would be made which would confirm the transmutation theory, and such discoveries, he thought, might be shortly forthcoming.

The meeting then adjourned.

MARCH 1ST, 1864.

DR. JAMES HUNT, PRESIDENT, IN THE CHAIR.

The minutes of the last meeting were read and confirmed.

The following new Fellows were announced:—The Rev. Dr. J. Bosworth; F. Chance, Esq.; B. Bond Cabbell, Esq., F.R.S.; C. C. Babington, Esq., F.R.S.; F. Carulla, Esq.; H. Charlton, Esq.; G. Critchett, Esq.; C. Capper, Esq.; H. Campbell, Esq.; H. Crowley, Esq.